



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/561,152 | 12/16/2005 | Yukio Nagasaki | 0171-1250PUS1 | 9582 |

2292 7590 10/16/2007
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

| |
|----------|
| EXAMINER |
|----------|

LISTVOYB, GREGORY

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1796

| | |
|-------------------|---------------|
| NOTIFICATION DATE | DELIVERY MODE |
|-------------------|---------------|

10/16/2007

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/561,152

Applicant(s)

NAGASAKI ET AL.

Examiner

Gregory Listvoyb

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/16/2005.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-13 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The dependency of Claim 9 and subsequent dependent claims 10-13 is not defined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

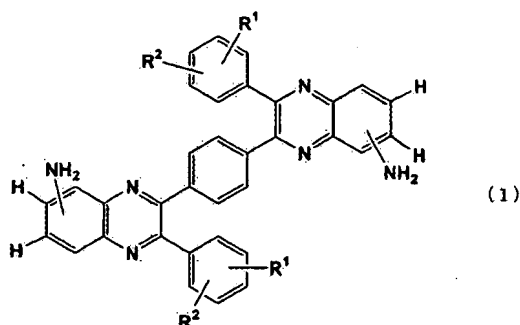
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1796

Claims 1, 3-9 rejected under 35 U.S.C. 102(b) as being anticipated by Furusho et al (Optical and Electrical properties..., J. of Photopolymer Sci and Tech, Vol 16, N2 (2003) p. 269-272) herein Furuto.

Furuto discloses a diaminobenzene compound represented by formula (1) below:



(where R1 and R2 each independently denote a hydrogen atom) (see page 269).

Regarding Claims 3-8 Furuto discloses a polyimide precursor and polyimide based on diamine of formula (1) and 1,2,4,5 benzene tetracarboxylic dianhydride (see page 270) (meeting the limitations of claims 6,7).

Note that Furuto did not openly disclose a polyamic acid of formula (2). However, since Furuto and the Applicant use the same standard method for polyimide synthesis, Furuto's reaction inherently has a step of polyamic acid (polyimide precursor) formation, resulting in precursor of formula (2).

Art Unit: 1796

Regarding number of units in polyimide (limitation "n" of Claims 3 and 4)), Mn of Furuto's polyimide is equal to 9370 (see page 271).

Regarding claims 9 and 13 since Furuto's polyimide film has the same structure as one in the Application examined, it inherently can be used as charge carrier transporting film, a fluorescent filter and liquid crystal alignment film.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 10-12 rejected under 35 U.S.C. 103(a) as being unpatentable over Furuto in combination with Jandke et al (Phenylquinoxaline ..., Macromolecules, 1998, 316434-6443) herein Jandtke.

Furuto discloses a diaminobenzene compound and polyimide film based on it.

Furuto discloses that his polyimide possesses excellent electrical, optical and and fluorescent properties (see page 270-272).

Regarding claim 2, Furuto does not disclose a diaminobenzene compound with R1 and R2 each independently denotes a C 1-20 alkyl group, C 1-20 alkoxy group, or C 1-20 fluoroalkyl group.

Jandtke disclose phenylquinoxaline-based polymers as electron transport material and fluorescent filter in light emitting diodes (see Abstract).

Jandtke teaches that phenylquinoxaline-based compounds with bulky substituents have better solubility in organic solvents and better stability in a glassy state, which is important in light emitting devices (see page 3440).

Therefore, it would have been obvious to a person of ordinary skills of the art to use substituted diaminobenzene compound in order for Furuto's polyimide in order to increase solubility of polymer and achieve its better stability in light emitting device.

Regarding claim 10-12, Furuto does not disclose the use of his polymer in light emitting device and as fluorescent filter.

Jandtke disclose phenylquinoxaline-based polymers as electron transport material and fluorescent filter in light emitting diodes (see Abstract). Jandtke's polymer showed excellent emission at 400-500 nm (blue emission). However, it is very difficult to prepare relatively high molecular weight phenylquinoxaline-based polymers. (see Table 1, where M_n is between 3400 and 5500), which may have an adverse effect on the mechanical properties of the film. In addition, Futuro's polyimide precursor will have a better solubility in organic solvents, which improve processability of the polymer.

Therefore, it would have been obvious to a person of ordinary skills of the art to use Futuro's polyimide in light emitting device in order to increase mechanical properties of the film and its processability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory Listvoyb whose telephone number is (571) 272-6105. The examiner can normally be reached on 10am-7pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1796

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gregory Listvoyb
Examiner
Art Unit 1796

GL


RABON SERGENT
PRIMARY EXAMINER